



PETROLEUM (LIQUID FUEL)

Definition

Petroleum or crude oil is **dark greenish brown viscous liquid found deep in earth's crust**. It is a mixture of various hydrocarbons.

Composition of Crude oil

Constituents	Percentage (%)
C	80- 87
H	11-15
S	0.1 – 3.5
N + O	0.1 – 0.5

Refining of Petroleum or crude oil

The **crude oil** is a mixture of oil, water and unwanted impurities. The process of removing impurities and separating crude oil into various fractions is called as Refining of Petroleum.

Steps of refining

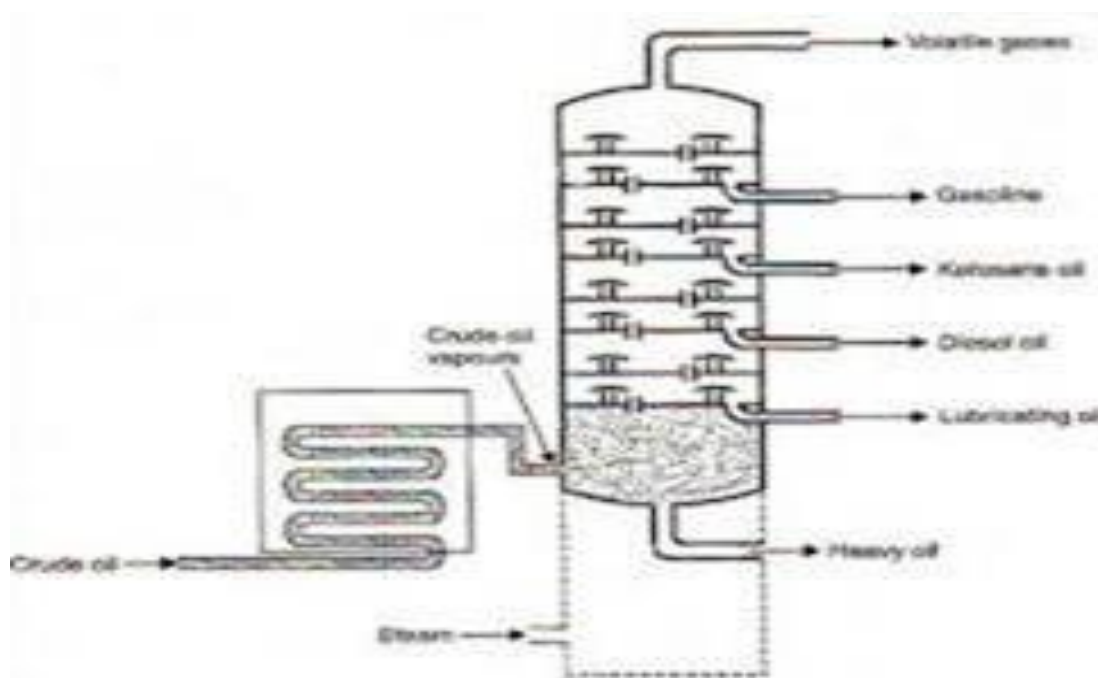
Separation of water (Cottrell's process)

The crude oil is an emulsion of oil and salt water. The crude oil is allowed to flow between two highly charged electrodes. Here the water droplets combine to form large drops which separate out from oil.

Removal of sulphur compounds

Sulphur compounds are removed by treating crude oil with copper oxide. The copper sulphide formed is separated by filtration.

Fractional distillation





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- Purified crude oil is heated to 400°C in an iron retort. The oil gets vapourised. The hot vapours are passed up a 'fractionating column'.
- The fractionating column is a tall cylindrical tower containing a number of horizontal steel trays at short distances.
- As the vapours go up they become cooler and get condensed at different trays.
- The fractions having higher boiling points condense at lower trays and the fractions having lower boiling points condense at higher trays.

Various fractions obtained during fractional distillation

No	Name of the fraction	Boiling point	Range of C atoms	Uses
1	Uncondensed gases	Below 30°C	C1 – C4	Fuel as LPG
2	Petroleum ether	30 – 70	C5 – C7	As solvent
3	Gasoline or petrol	40 – 120	C5 – C9	Fuel for IC engine
4	Naphtha or solvent spirit	120 – 180	C9 – C10	Solvent in paints, dry cleaning
5	Kerosene	180 – 250	C10 – C16	Fuel
6	Diesel	250 - 320	C15 – C18	Diesel engine fuel
7	Heavy oil	320 - 400	C17 – C30	Fuel for ship

Fractions of heavy oil

No	Name of the fraction	Uses
1	Lubricating oils	As lubricants.
2	Petroleum jelly(Vaseline)	Medicines and cosmetics.
3	Grease	As lubricant.
4	Paraffin wax	Used in candles, boot polishing.
5	Pitch	Making road, water proof roofing.